An Analysis of Donor Blood Wastage in a Blood Bank in Rural Karnataka

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ABSTRACT

This study was conducted to know the various reasons for donor blood wastage and how to prevent the donor blood wastage.

This study was conducted for a period of 2 years from Jan 2009 to Dec 2010 in H.S.K. Blood Bank attached to S.N. Medical College and H.S.K. Hospital, Bagalkot (Karnataka) in southern India. All blood units collected during study period were included.

Total blood units collected during study period was 6129 units and total blood units discarded were 263. Voluntary blood donation (VBD) was 3.99%. In the discarded blood units majority were HbsAg Positives (179 Units) and second was due to outdating (38 units).

To conclude, we require blood donor awareness programs for public to increase VBD & screening for HbsAg & HIV by rapid tests before bleeding, follow type and screen protocol, to arrange near expiry blood units in front shelves of freezers, not to bleed the rare & Rh negative blood when not required & to have proper inventory management in blood bank to prevent donor blood wastage. Regular audit of blood issue and discard is essential by hospital transfusion committee.

Key Words: Donor blood wastage, Blood donation, Type and Screen Protocol

INTRODUCTION

Blood consists of three formed elements, namely the red cells (erythrocytes), white cells [1] (leucocytes) and platelets (thrombocytes), suspended in fluid medium, the plasma. These cells are continually being destroyed, either because of old age or as a result of their functional activities, and are replaced by newly formed cells. In healthy subjects there is a finely adjusted balance between rate of formation and destruction and thus the number of each cell type remains remarkably constant, although there are minor daily physiological fluctuations.

Whenever this balance is disturbed hugely by over destruction, less production or external loss which cannot be compensated by our own production we require blood transfusion.

Blood group types are mainly A, B, AB & O. In 1901, Karl Landsteiner [2], an Austrian physician discovered the first three human blood groups. On his birthday i.e. June 14th World Blood Donor's day is celebrated.

O +ve 1 person in 3	O –ve 1 person in 15				
A +ve 1 person in 3	A –ve 1 person in 16				
B +ve 1 person in 12	B –ve 1 person in 67				
AB +ve 1 person in 29 AB -ve 1 person in 167					
[Table/Fig-1]: Frequency of Blood Types [3]					

India's blood requirement is about 9 to 9.5 million units per year [4]. Blood banks in India are able to collect only about 5 to 5.5 million units per year. The shortage of blood is 40%. Patients actually die because the right kind of blood does not reach them in time. Major short fall is in summer. The heavy short fall in supply encourages in racketing in blood & blood products. It also encourages blood donation for money, encouraging "professional" donorship. Professional donors come from weaker sections of society and are rarely in ideal health for blood donation and do it for commercial reasons. The risk of infection is also high in blood collected from professional donors. WHO recommends developing strategies for [5] 100% voluntary blood donation (VBD) and 5 states in India achieved more than 80% VBD. Need for blood increases every year by 5%. One pint of blood can [3] save up to 3 lives. Only 4% of eligible population in India donates bloods. It is believed that if 2% of India's total population donates [6] blood once a year, the blood requirement of the country can be easily met.

Blood usually required by accident victims, cancer patients, blood disorder patients [7] surgery patients especially heart surgery & organ transplants and in premature, preterm babies. Each year by blood transfusion 4.5 million Indians are saved.

Total blood units collected [8] in Karnataka in 2006 is 357494 in that voluntary blood units collected are 187604 (52.47%) and about 3803 units of blood are discarded because of positives (HIV, HbsAg, HepatitisC, Malaria & VDRL)



[Table/Fig-2]: Proportion of Voluntary & Replacement Blood collection (Karnataka) [8] This study was conducted to know the reasons for donor blood wastage & how to prevent the donor blood wastage as the blood is very important in saving lives & there is huge shortage of blood in India.

MATERIAL & METHODS

This study was conducted for a period of 2 year i.e. from Jan 2009 to Dec 2010 in HSK blood bank attached to S.Nijalingappa Medical College & HSK hospital in Bagalkot (Karnataka state) in southern India.

All the whole blood units collected from the blood bank over period of 2 years were included in the study. We have done detail analysis of collection type, the number of units issued, number of donor blood discarded and the various reasons for donor blood wastage.

RESULTS

The total blood units collected during study period was 6129 units out of which 5857 units issued to recipients and total blood units disarded were 263.

The total blood units collected by voluntary blood donation were 245 units (3.99%). Out of 263 blood units discarded HbsAg tops the list with 179 blood units, second was outdating with 38 blood units and third in list was HIV positives with 23 blood units.

Month	Voluntary	Replace- ment	Total	Issue	Discard
Jan 2009	00	208	208	203	10
Feb 2009	03	157	160	149	04
Mar 2009	01	209	210	200	09
Apr 2009	04	190	194	183	09
May 2009	00	175	175	167	12
Jun 2009	00	218	218	219	09
Jul 2009	01	206	207	203	08
Aug 2009	01	230	231	219	12
Sept 2009	14	214	228	217	12
Oct 2009	02	253	255	243	08
Nov 2009	02	288	290	275	14
Dec 2009	00	255	255	257	11
Total	28	2603	2631	2535	118

[Table/Fig-3]: Blood bank statistics for the year 200

Month	HIV	HbsAg	HCV	Outdat- ing	Less Bleed	Total Discard
Jan 2009	02	04	02	01	01	10
Feb 2009	-	04	-	-	-	04
Mar 2009	01	07	_	-	01	09
Apr 2009	01	05	02	01	-	09
May 2009	03	06	-	03	_	12
Jun 2009	-	08	01	-	-	09
Jul 2009	-	07	-	-	01	08
Aug 2009	01	09	02	-	-	12
Sept 2009	01	10	-	01	-	12
Oct 2009	-	07	-	01	-	08
Nov 2009	02	09	-	02	01	14
Dec 2009	01	07	01	02	-	11
Total	12	83	08	11	04	118
[Table/Fig-4]: Blood Units Discard statistics for the year 2010						

Month	Voluntary	Replace- ment	Total	Issue	Discard
Jan 2010	35	269	304	268	12
Feb 2010	01	200	201	198	12
Mar 2010	01	269	270	261	16
Apr 2010	33	302	335	294	14
May 2010	00	246	246	244	12
Jun 2010	00	263	263	269	09
Jul 2010	00	313	313	310	07
Aug 2010	46	346	392	347	13
Sept 2010	80	276	356	294	18
Oct 2010	00	323	323	333	13
Nov 2010	21	255	276	279	12
Dec 2010	00	219	219	225	07
Total	217	3281	3498	3322	145
[Table/Fig-5]: Blood Units Discard statistics for the year 2009					

Out of 38 blood units total Rh negative blood units are 10 (A, B, AB & O).

Month	HIV	HbsAg	HCV	Outdating	Less Bleed	Total Discard
Jan 2010	-	09	01	02	_	12
Feb 2010	01	07	01	03	_	12
Mar 2010	03	09	02	02	_	16
Apr 2010	01	10	01	02	_	14
May 2010	_	10	01	01	_	12
Jun 2010	_	06	02	01	_	09
Jul 2010	_	04	01	02	_	07
Aug 2010	01	11	_	01	_	13
Sept 2010	03	11	01	03	_	18
Oct 2010	_	06	-	06	01	13
Nov 2010	01	08	_	03	_	12
Dec 2010	01	05	-	01	_	07
Total	11	96	10	27	01	145
Table/Fig.61: Blood Units Discard statistics for the year 2010						

Blood Group & Rh Type	2009	2010	Total		
A + ve	03	03	06		
B + ve	03	05	08		
AB + ve	00	00	00		
O + ve	04	10	14		
A – ve	00	04	04		
B – ve	00	00	00		
AB – ve	01	00	01		
O –ve	00	05	05		
Total	11	27	38		
Table /Fig 71 Plead Unite Outdating (Plead group wise)					

[Table/Fig-7]: Blood Units Outdating (Blood group wise

DISCUSSION

In this study total blood units collected by voluntary donation is just 3.99%. Compared to Karnataka state voluntary blood donation it is 52.47% (% VBD in NACP-II) [6] which shows there is [9] lack of awareness in general public regarding blood donation & it has to be addressed seriously & urgently by both government & NGO's by blood donation awareness programmes at public level.

Our Bagalkot district is in 7th position among all Indian districts with very high seropositivity (2.9%) [10] & high prevalence of HbsAg. As per our study highest number of donor blood wastage is due to HbsAg positive (179 units).

As for HIV concerned we are in highest prevalence area because of devdasi [11] belt in Jamkhandi (Savadatti) & as per NACO10 ours is category A district (ANC>1%) & second in Karnataka to have highest patients on ART. [12] HIV is the third common cause for donor blood wastage. So we suggest screening by rapid tests for HIV & HbsAg before bleeding to prevent donor blood wastage.

Second in the list was to prevent wastage due to outdating we recommend to follow type & screen protocol. This protocol includes screening for other antigens apart from routine ABO& Rh typing like ABO (A1&A2), Rh (e&c), Bombay, Parabombay, MNS and Kell, Lewis, Duffy& auto antibodies depending upon protocol and incidence of other groups. One study in Hong Kong [13] reduced outdating rate by 11.5% to 1.3% by this protocol. Not to bleed Rh negative & rare blood group for replacement or in voluntary camps to prevent outdating as their requirement is less. Blood bank to arrange the blood units of near expiry in front shelves in [14] freezers & to have proper inventory management in blood bank [15]. So that they can be used in judicious way and wastage can be reduced. Every effort to indentify the critical areas of blood transfusion services & processes should be done to reduce number of discarded blood units [16].

Each hospital should have a hospital transfusion committee which should include transfusion specialist, pathologist, blood bank officer, clinician, surgeon, public relation officer and hospital administrator. Regular audit of transfusion of blood & its components is essential by hospital transfusion committee to reduce donor blood wastage &to promote rational blood use [17],[18].

CONCLUSION

- This district needs blood donation awareness programmes for general public to reach NACO III target for VBD.
- Screening of HbsAg & HIV by rapid slide tests before bleeding.
- Not to bleed rare blood groups &Rh negative blood groups until required.
- To follow type & screen protocol.
- Arrange near to expiry blood units in front shelves of freezer in blood banks.
- Regular audit by hospital transfusion committee.

ACKNOWLEDGEMENT

The authors wish to thank Dr. Ashok Mallapur, Principal, S. Nijalingappa Medical College for his guidance during this study.

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DECLARATION ON COMPETING INTERESTS:

No competing Interests.

Date of Submission: Aug 13, 2011 Date of peer review: Sep 15, 2011 Date of acceptance: Sep 22, 2011 Date of Publishing: Nov 30, 2011